

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated March 8, 2006 (U.S. Patent Office Paper No. 03022006). In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1 - 23 stand for consideration, wherein claim 1 is being amended to more particularly point out and distinctly claim the subject invention, and new claim 23 is hereby submitted for consideration. Claims 10 - 22 stand withdrawn from further consideration without prejudice or disclaimer.

Additional Amendments

The specification is being amended to correct formal errors and to better disclose and describe the features of the present invention as claimed. All amendments to the claims are fully supported therein, including page 8, line 8 to page 9, line 20; and page 11, line 20 to page 12, line 11. Applicant hereby submits that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejections

The Examiner rejected claims 1-9 under 35 U.S.C. §103(a) as being unpatentable over Kagotani et al. (US Patent No. 5,419,938). Applicants have reviewed the above-noted rejection and hereby respectfully traverse.

The present invention as now recited in claim 1 is directed to a magnetic recording medium at least comprising: a substrate having a surface; a nanoparticle layer comprising an array of nanoparticles having an average particle size of at least 1 nm and not more than 20 nm, consisting of metal elements and containing at least one element selected from the group consisting of Fe, Co, Ni, Mn, Sm, Pt, or Pd; and an organic compound located between the array of nanoparticles, wherein an easy axis of magnetization of the nanoparticles is orientated substantially parallel to a direction which is at a particular angle to the substrate surface.

In contrast to the present invention, the reference of Kagotani '938 is merely directed to showing a magnetic recording medium made only from hexagonal ferrite particles. Hexagonal ferrite particles are the only material disclosed in this reference. Applicants will contend that one of skill in the art would not consider the present invention as claimed obvious in view of the fact that the characteristics of hexagonal ferrite particles are so different from those of metals as used in the present invention.

Specifically, Applicants will contend that it is well known in the art nanoparticles ($d = 1-20$ nm) are categorized into at least four different types: organic, organic metal, metal and hexagonal ferrite. The present invention relates to metal nanoparticles, while Kagotani '938 relates specifically to hexagonal ferrite nanoparticles. It is also well known in the art that hexagonal ferrite particles are by definition magnetized. As such, when hexagonal ferrite particles are introduced or incorporated into any materials, such particles already have magnetization and will thus exhibit behavior consistent with magnetized materials. Applicants have provided herewith Drawings A-D which illustrate the differences between the present invention and the teachings of Kagotani '938.

In the case of forming a magnetic layer as disclosed in Kagotani '938 in col. 9, lines 32-43, Applicants have found that the hexagonal ferrite particles will initially form into masses when the magnetic layer is painted onto a substrate (see Drawing A attached hereto). When a magnetic field is applied to the magnetic layer, the hexagonal ferrite particles remain in those masses, and each mass no matter how large or small it may be becomes a single bit of data on the magnetic media (see Drawing B attached hereto). Because different sized masses become the separate bits of data, recording density is subject to the size of the masses formed, and thus difficult to control and increase effectively.

The present invention, on the other hand, uses metal particles that are not magnetized prior to forming the magnetic layer (see Drawing C attached hereto). Since the particles are not magnetized, the particles do not form masses by virtue of any magnetic attraction to one another, and thus spread out in the magnetic layer more uniformly. When a magnetic field is applied to the magnetic layer, data bits are formed by individual particles, instead of by masses of particles (see Drawing D attached hereto). This in turn results in a recording density that can be increased.

In light of all the above, Applicants will contend that the present invention as now claimed would not have been obvious in view of Kagotani '938. First, this reference fails to disclose, teach or suggest any structure incorporating any materials other than hexagonal

ferrite particles. As a matter of fact, this reference is specifically directed only to a magnetic recording medium that is formed using hexagonal ferrite particles.

Second, hexagonal ferrite particles exhibit completely different characteristics than metal nanoparticles, as explained above. As such, the magnetic recording medium disclosed by Kagotani '938 cannot embody any of the features or advantages achieved by the present invention, nor can that reference render any of those features obvious to one of skill in the art, all as explained above. Rather, the present invention as claimed is distinguishable and thereby allowable over the prior art of Kagotani '938.

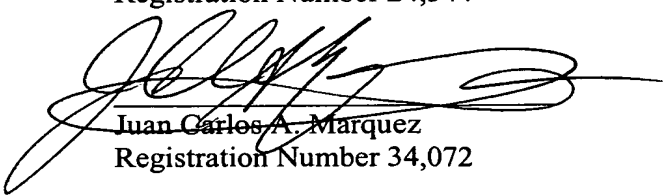
Conclusion

In view of all the above, Applicant respectfully submits that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

Respectfully submitted,

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